

## PATENT COOPERATION TREATY

PCT

REC'D 14 DEC 2005

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

PCT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 52131 WO	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/IB2003/006124	International filing date (day/month/year) 22-12-2003	Priority date (day/month/year)
International Patent Classification (IPC) or national classification and IPC See Supplemental Box		
Applicant Nokia Corporation et al		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
  - ☒ (sent to the applicant and to the International Bureau) a total of 5 sheets, as follows:
    - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- |                                     |              |   |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the report   |
| <input type="checkbox"/>            | Box No. II   | Priority  |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention  |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited   |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application  |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application   |

Date of submission of the demand 10-05-2005	Date of completion of this report 24-11-2005
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Åsa Rydenius/MN Telephone No. +46 8 782 25 00

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/IB2003/006124

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Cover sheet

**H04L 1/18** (2006.01)

**H04B 7/005** (2006.01)

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/IB2003/006124

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

- ☐ the international application in the language in which it was filed
- ☐ a translation of the international application into \_\_\_\_\_,  
which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1 - 26 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* 31 - 33 \_\_\_\_\_ as amended (together with any statement) under Article 19
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- pages 1 - 7 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/IB2003/006124

**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-16</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-16</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-16</u>	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

Documents cited in the International Search Report:

D1: WO0203600 A1

D2: WO03105394 A1

D3: WO03077464 A1

D4: US6175560 B1

D5: US2003012165 A1

D6: WO0217548 A1

The cited documents represent the general state of the art.

The inventions defined in claims 1-16 is not disclosed by any of these documents.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed method and network for decreasing the transmission delay in a multi-channel data transmission of physical layer frames using hybrid automated repeat request signalling. Therefore, the claimed inventions are not obvious to a person skilled in the art.

Accordingly, the inventions defined in claims 1-16 are novel and are considered to involve an inventive step. The inventions are industrially applicable.

## PATENT COOPERATION TREATY

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04-07-2005

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From the INTERNATIONAL BUREAU

NOTIFICATION CONCERNING  
AMENDMENTS OF THE CLAIMS(PCT Rule 62 and  
Administrative Instructions, Section 417)

To:

Swedish Patent Office  
P.O. Box 5055  
S-102 42 Stockholm  
Sweden

Date of mailing (day/month/year)

24 June 2005 (24.06.2005)

in its capacity as International Preliminary Examining Authority

International application No.

PCT/IB2003/006124

International filing date (day/month/year)

22 December 2003 (22.12.2003)

Applicant

NOKIA CORPORATION et al

The International Bureau hereby transmits a copy of the amendments to the claims under Article 19 together with any accompanying statement (Rule 62).

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 338.70.60

Authorized officer

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**AMENDED CLAIMS**

**PCT/IB03/006124**

**AMENDED CLAIMS**

[received by the International Bureau on 10 November 2004 (10.11.2004);  
original claims 1-18 replaced by new claims 1-16 (3 pages)]

10 NOV 2004

Applicant: Nokia Corporation  
Application number: PCT/IB2003/006124  
Date:

November 3, 2004

### Claims

- 5 1. Method for decreasing a transmission delay in a multi-sub-channel data transmission of physical layer frames using hybrid automated repeat request with acknowledgement signaling, wherein said method comprises:
- 10 determining, if no physical layer frame needs to be transmitted in a provided sub-channel, determining, if there is a physical layer frame of another sub-channel with pending acknowledgement, selecting said physical layer frame with pending acknowledgement, if no physical layer frame needs to be transmitted in the provided sub-channel, and transmitting said selected frame in said provided sub-channel.
- 15 2. Method according to claim 1, further comprising: determining, if there are physical layer frames with pending acknowledgement that have been previously selected, and selecting another physical layer frame with pending acknowledgement that has not been previously selected.
- 20 3. Method according to claim 1 or 2, wherein said physical layer frame with pending acknowledgement, is selected, wherein said pending acknowledgement is pending for a longer time period than the acknowledgement any of the other frames.
- 25 4. Method according to anyone of the preceding claims, wherein said physical layer frame with pending acknowledgement is selected, wherein said pending acknowledgement is pending for a shorter time period than the acknowledgement of any of the other frames.
- 30 5. Method according to anyone of the preceding claims, wherein said physical layer frame with pending acknowledgement, is randomly selected.
- 35 6. Method according to anyone of the preceding claims, further characterized by: determining a threshold number, based on the number of sub-channels in said multi-sub-channel data transmission, determining the number of physical layer frames to be transmitted in all sub-channels, and

controlling the transmission power of the transmission of the physical layer frames, on the basis of the relationship between said threshold number and said determined number of physical layer frame.

- 5 7. Method according to claim 6, wherein said controlling of the transmission power comprises:  
increasing the transmission power for the transmission of the physical layer frames, if  
said threshold number exceeds said determined number of physical layer frames to be  
transmitted.
- 10 8. Method according to claim 6 or 7, further comprising determining an error rate, and wherein  
said determining of said threshold number, is also based on said determined error rate.
9. Method according to claim 8, wherein said controlling of said transmission power, is also  
related to said determined error rate.
- 15 10. Method according to anyone of claims 6 to 9, wherein said controlling of the transmission  
power comprises:  
decreasing the transmission power, if said determined number of physical layer frames to  
be transmitted exceeds said threshold number.
- 20 11. Method according to anyone of the preceding claims, wherein said multi-sub-channel data  
transmission is an uplink of a dedicated transport channel in universal terrestrial radio access.
- 25 12. Computer program product comprising program code means stored on a computer readable  
medium for carrying out the method of anyone of claims 1 to 11 when said program product  
is run on a computer or network device.
- 30 13. Computer program product comprising program code, downloadable from a server for  
carrying out the method of anyone of claims 1 to 11 when said program product is run on a  
computer or network device.
- 35 14. Wireless communication network device capable of decreased transmission delay in a multi-  
sub-channel data transmission of physical layer frames using hybrid automated repeat request  
with acknowledgement signaling, wherein said network device comprises:  
a processing unit,  
a storage, connected to said processing unit,  
a radio interface for said multi-sub-channel data transmission of physical layer frames



using hybrid automated repeat request, wherein said radio interface is connected to said processing unit and to said storage, and wherein said radio interface comprises a transmitter and a receiver,

characterized by

5 a first component for determining, if no physical layer frame needs to be transmitted in a provided sub-channel,

a second component for determining, if there is a physical layer frame of another sub-channel with pending acknowledgement,

10 a third component for selecting, said physical layer frame with pending acknowledgement, if no physical layer frame needs to be transmitted in the provided sub-channel, and

a fourth component for transmitting said selected frame in said provided sub-channel,

15 wherein said first component said second component said third component and said fourth component are each connected to said radio interface, and wherein said first component is connected to said second component, said second component is connected to said third component, and said third component is connected to said fourth component.

15. Wireless communication network device according to claim 14, further characterized by

20 a component for determining a threshold number, based on the number of sub-channels in said multi-sub-channel data transmission, wherein said component for determining said threshold number is connected to said radio interface;

a component for determining the number of physical layer frames to be transmitted in all sub-channels, wherein said component for determining said number of physical layer frames is connected to said radio interface, and

25 a component for controlling the transmission power of said transmitter for the transmission of the physical layer frames, in dependence of the relationship between said threshold number and said determined number of physical layer frames, wherein said component for controlling is connected to both of said components for determining and to said radio interface.

30 16. Wireless communication network device according to anyone of claims 14 or 15, characterized in that said network device is a mobile user terminal device.